

Halogeton, A Poisonous Plant Recently Introduced into North Dakota Rangelands

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Several small and medium sized patches of halogeton, a plant toxic to sheep, cattle, and herbivorous wildlife, have been located in the Badlands Area of western North Dakota, on both sides of the Little Missouri River and north of Interstate Highway 94, by Carmen Waldo, Natural Resources Specialist (Minerals) with the US Forest Service in the Medora Ranger District.

Halogeton, previously unknown to occur in North Dakota, was initially introduced during the 1930's into North America from the cold desert region of Eurasia. The plant spread rapidly and quickly became a serious problem weed in the Intermountain Great Basin Region of western United States. The plant thrives on the arid alkaline and saline soils in Nevada, Utah, Wyoming, Idaho, Oregon, and Colorado. Halogeton is listed as a noxious weed in the states of Arizona, California, Colorado, Hawaii, New Mexico, and Oregon.

Halogeton (*Halogeton glomeratus* (M. Bieb.) C.A. Mey.) is a member of the Goosefoot family and is an introduced, warm season, summer annual herb with horizontal spreading branches that curve upward to around 2 feet in height. The taproot can grow to about 20 inches in depth. Immature plants appear similar to young Russian thistle and kochia plants. Mature plants have red stems with small, round, fleshy, blue-green leaves about a half inch long with a single hair protruding out of the end. The leaf resembles a miniature sausage or wiener on a stick. Plants have small, inconspicuous yellow flowers during July through September and produce enormous quantities of seed, averaging around 75 seeds per inch of stem. Two types of seeds are produced each year. The black winged seeds, developed after mid August, can remain viable for about 1 year, and have a short after-ripening period that permits quick germination. The black seeds can imbibe water and germinate in less than 1 hour. The brown wingless seeds, developed before mid August, are dormant at maturity permitting the seeds to survive in soil for 10 years or more. The seeds are dispersed by wind, water, human activities, through the digestive tract of sick animals, and when dry plants break off at ground level and tumble with the

wind. Germination of most seeds occurs during late fall or early spring.

Halogeton plants contain unusually heavy concentrations of soluble oxalates which are bound primarily as sodium salts. Concentrations of the soluble oxalates are highest in the leaves (14 to 25%) and lowest in the stems (1 to 4%) and seeds (2%). Most of the sodium oxalates in the stems are insoluble and thus nonpoisonous. The content of the soluble sodium oxalates tends to be relatively high during midsummer and may exceed 30% in leaf samples from late August to frost. Dead plants remain almost as poisonous as the living plants. After ingestion, soluble sodium oxalates are readily absorbed into the circulatory system. The sodium ions are replaced by calcium withdrawn from blood serum. This calcium reduction disrupts blood coagulation, and nerve and muscle function resulting in staggering and muscular spasms similar to milk fever. These calcium oxalates formed in the blood are precipitated in the liver and kidneys, which then interferes with normal function of these organs. A lethal dose of foliage at 0.3 to 0.5% of the animal's body weight can cause death within 24 hours. About 1.5 lbs of foliage can kill a sheep and about 3 to 5 lbs can kill a cow. As little as 12 oz of foliage can be fatal to animals in poor condition. Cattle generally develop subacute symptoms from halogeton poisoning when abundant good forage is available because the bitter taste of halogeton discourages consumption of large enough quantities of foliage to cause acute symptoms and death.

Halogeton competes poorly with healthy, established perennial vegetation, however, open areas with bare saline-alkali soils facilitate its invasion and establishment. Control can be troublesome because of the large quantity of seeds produced annually and the long survival period of the brown seeds. Three herbicides have been shown to effectively manage halogeton in the Great Basin Region. Control of young plants during June, prior to the start of flowering, is possible with 2, 4-D applied at 1.0 to 2.0 lbs acid equivalent (ae) (1.1 to 2.1 qt product) per acre and, when plants are mature, application of 2.0 to 6.0 lbs ae (2.1 to 6.3 qt product) per acre is

effective. One application of tebuthiuron (Spike 20P) at 0.5 lb active ingredient (ai) (2.5 lb product) per acre should provide control for 3 to 5 years. Metsulfuron (Ally XP, Cimarron, Cimarron X-tra, and Cimarron Max) is effective at 0.2 oz ai (0.33 lb product) per acre. There are no currently registered biocontrol agents for halogeton, however, there are a few experimental agents ready for field testing.

Halogeton has the biological ability to develop into a very troublesome noxious poisonous plant in our western rangelands, however, during these early stages of invasion, eradication from North Dakota soils still is possible if decisive action is implemented before the plant population reaches crisis level.



CDFA/BCSP

Distribution of *Halogeton glomeratus* (M. Bieb.) C. A. Mey.

Map from <http://www.cdfa.ca.gov/PHPPS/ipc/weedinfo/usedimages/halogetonmap.html>



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